



Transportation

Submitted via email to vwsettlement@ecy.wa.gov

December 15, 2017

Brett Rude and Camille St. Onge
Department of Ecology, State of Washington
30 Desmond Drive SE
Lacey, WA 98593
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Camille.st.onge@ecy.wa.gov / 360-407-6932

RE: Renton School District Comments on Washington's Use of Volkswagen Mitigation Trust Funds

Dear Mr. Rude and Ms. St. Onge:

The Environmental Mitigation Trust (EMT) and the \$112.7 million it will yield for Washington represents an unprecedented opportunity to deploy reliable and advanced transportation solutions while simultaneously prioritizing children and clean air. Renton School District would like to thank the Department of Ecology for the opportunity to comment on Washington's Proposed Volkswagen Beneficiary Mitigation Plan. We are encouraged by the proposed plan's focus on innovation and prioritization of transformative electric vehicle projects, as Renton is looking forward to participating in Washington's EMT funding in order to modernize our school bus fleet with the purchase of new all-electric vehicles.

While the EMT gives Washington the flexibility to fund a variety of conventional and alternative fuel on- and off-road vehicle projects, **we believe that all-electric school bus projects will provide the most comprehensive suite of benefits.** This includes reducing harmful nitrogen oxide (NOx) and greenhouse gas (GHG) emissions, delivering air quality benefits to our young student riders who are exposed to diesel pollution from buses on a daily basis, and providing total cost of ownership benefits to ease our school district's already tight budget. To that end, we urge the state to further open the on-road vehicle portion of the funding plan in order to include a school-bus specific funding opportunity in the final plan.

I have outlined a series of recommendations below that addresses how Washington can support all-electric school bus projects. We have noted the recent advancements in the electric vehicle market and we hope to support Washington deploy more zero-emission vehicles. Our recommendations align well with the recent results of Washington's survey of the most recent stakeholder comments and we look forward to working with your team to ensure a successful roll-out of funds.

The EMT Provides Washington with the Opportunity to Fund Innovative and Transformative Transportation Projects

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The medium- and heavy-duty diesel transportation sector is the leading source of mobile source NO_x emissions from diesel vehicles in Washington, accounting for 46% of the total.¹ By directing funds towards projects that reduce these emissions sources, Washington can most effectively mitigate these emissions' harmful air quality and health impacts.

While aging diesel-fueled vehicles generate the most mobile source NO_x emissions, some medium- and heavy-duty fleets have turned to gaseous fuels, such as compressed natural gas (CNG) and propane autogas, to help mitigate NO_x emissions. These, however, are temporarily solutions – President Barack Obama, in his 2014 State of the Union address, referred to natural gas as a “bridge fuel.”² Fortunately, there are now commercially available all-electric and hybrid-electric medium- and heavy-duty vehicles on the other side of the bridge. Recent technology advancements in the electric vehicle technology market have allowed technology providers heretofore unprecedented access to these markets and fleets can now select from an increasing array of zero-emission and hybrid options.

States across the U.S. have taken strides to fund the advancement of clean transportation solutions. Incentive programs, such as California's Hybrid and Zero-Emission Truck and Bus Voucher Incentive Project (HVIP) and the New York Truck – Voucher Incentive Program (NYT-VIP), catalyze the growth of the electric vehicle market, while providing significant air quality and climate benefits. Renton School District encourages Washington to recognize the merits of these programs and recommends that you support their proliferation by creating a similar, school bus-specific program with our state's allocation of Volkswagen funds.

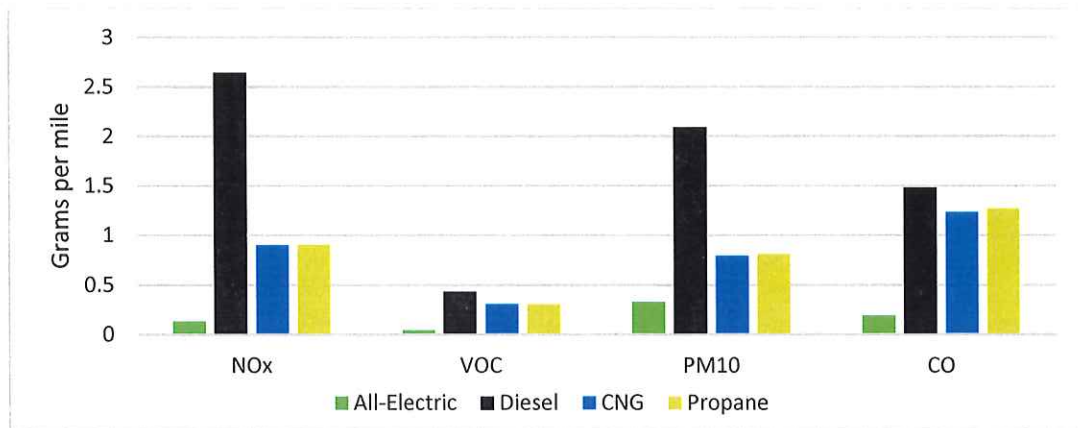
All-Electric School Buses Improve Air Quality and Public Health for Children and Adults via Unparalleled NO_x Reductions

Most relevant to the Volkswagen funds, we find it important to first focus on the settlement's main objective: reduce NO_x emissions. *Figure 1* below compares the performance of various fuel types in heavy-duty school buses, which makes clear that electric vehicle technologies should be a top priority.

¹ “2014 National Emissions Inventory (NEI) Data”. United States Environmental Protection Agency. <https://www.epa.gov/air-emissions-inventories/2014-national-emissions-inventory-nei-data>.

² “President Barack Obama's State of the Union Address”. The White House, Office of the Press Secretary, January 28, 2014. <https://obamawhitehouse.archives.gov/the-press-office/2014/01/28/president-barack-obamas-state-union-address>.

Figure 1: Emissions Benefits (grams per ton) of All-Electric Heavy-Duty School Bus vs. Other Fuel Types³



These emissions reductions correlate directly with air quality and public health benefits. According to the EPA’s Diesel Emissions Quantifier, the replacement of just one diesel school bus with an all-electric model will generate \$20,000 in public health benefits each year.⁴ These benefits represent the dollar value of health benefits generated from reducing the population’s exposure to PM2.5 emissions and include the reduction of premature mortality, chronic bronchitis, asthma attacks, non-fatal heart attacks, and other health problems. In school bus applications, these emissions reductions are particularly important, given that children’s exposure to harmful air pollutants may be 5-15 times higher inside the bus.⁵

A recent study by the University of Delaware evaluated the costs and benefits associated with a V2G-capable electric school bus compared to a traditional diesel school bus.⁶ The study looked at a variety of data points and metrics to compare the fuel types in a school bus application and found that diesel school buses created public health costs of \$0.08 per mile. This is 800% more expensive than the public health costs of an all-electric bus, which is just \$0.0149 per mile.

Washington Should Prioritize Projects that Deliver Total Cost of Ownership Benefits to State School Districts

All-electric school buses deliver total cost of ownership benefits that far exceed any of its conventional and alternative fuel competitors. We have provided the infographic below to demonstrate these benefits, which identifies that Washington has the opportunity to provide incentive funding capable of generating tremendous

³ Figure 1 contains the best available current data from seventeen different studies and air emission analyses, including emissions data reported by the U.S. Environmental Protection Agency, U.S. Department of Energy, and Argonne National Laboratory.

⁴ “Diesel Emissions Quantifier.” U.S. Environmental Protection Agency, <https://www.epa.gov/cleandiesel/diesel-emissions-quantifier-deq>. Analysis assumes MY 2000 diesel school bus; annual diesel fuel consumption of 1,360 gallons, annual VMT of 14,084, and 107 idling hours per year (these are EPA DEQ default values).

⁵ “Electric School Buses Feasibility in Vermont”. Vermont Energy Investment Corporation, May 2016. <https://www.veic.org/docs/resourceLibrary/veic-electric-school-bus-feasibility-study.pdf>, page 6.

⁶ Noel, L. and McCormack, R. “A Cost Benefit Analysis of a V2G-Capable Electric School Bus Compared to a Traditional Diesel School Bus”. University of Delaware, 2014. <https://www1.udel.edu/V2G/resources/V2G-Cost-Benefit-Analysis-Noel-McCormack-Applied-Energy-As-Accepted.pdf>.

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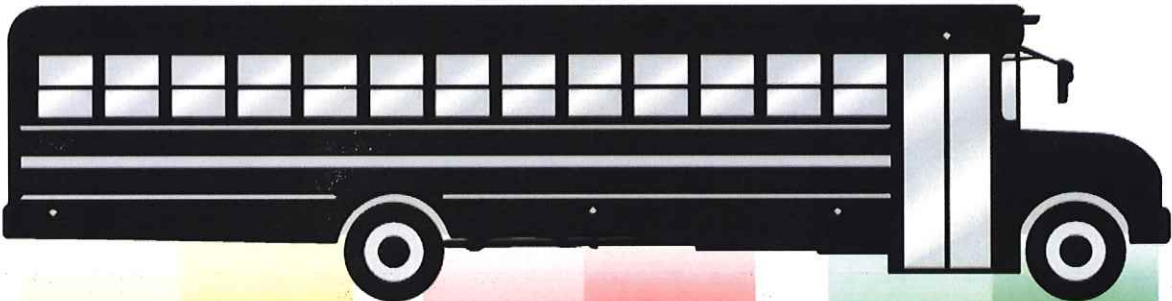
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annual cost savings for school districts throughout the state. In other words, for every dollar invested in all-electric school buses, Washington can mitigate public health concerns for the most susceptible of disadvantaged communities, generate cost savings for budget-constrained school districts, and support the advancement of innovative clean transportation technologies.

ADOMANI

ALL-ELECTRIC SCHOOL BUSES



PURCHASE

	ALL-ELECTRIC*	DIESEL**
o MSRP (including 8% tax)	\$347,750	\$139,100
o VW Settlement Incentive Amount (at Incremental Cost)	(\$208,650)	N/A
o Customer Cost	\$139,100	\$139,100

\$0

Additional Investment Required
(for Zero-Emission Buses)

OPERATIONS

	ALL-ELECTRIC*	DIESEL**
o Maintenance	\$1,770	\$8,075
o Diesel Fuel	N/A	\$8,880
o Battery Power	\$2,714	N/A
o Cost of Ownership (Annual)	\$4,484	\$16,955

\$10,521

Annual Zero-Emission Savings
(Diesel Diesel)

SAVINGS

	ALL-ELECTRIC*	DIESEL**
o Cost of Ownership (Over 15 Years)	\$97,260	\$235,075
o New Battery (at Year 0)	\$43,000	N/A

\$112,215

Zero-Emission Savings
(Over 15-year Lifetime Versus Diesel)

Your state can provide the incentives required to deploy all-electric vehicles at no additional cost to consumers, which will generate substantial annual and full-life total cost of ownership benefits

* eLion Type C 75-mile All Electric Bus
** Conventional Diesel Bus

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Washington Should Account for the "Beyond Transportation" Benefits of All-Electric and Hybrid-Electric Vehicles

All-electric vehicles provide benefits beyond emissions reductions and safe transportation. These vehicles' battery systems serve as a valuable and reliable energy resource that can be exported from the vehicles. For example, reversing the flow of energy from the vehicle to the grid would allow buses to plug in to the grid as needed. In other words, all-electric vehicles can provide utilities and homeowners with access to power during emergencies or peak demand.

Indeed, recent research has shown that vehicle-to-grid (V2G) systems can decarbonize transportation, support load balancing, and increase revenues for electricity companies and create new revenue streams.⁷ V2G and other strategies, including vehicle-to-load and off-grid storage, will play a key role in our state's energy infrastructure future and we hope to support that future by expanding our fleet of electric vehicles.

Conclusion – Prioritize our Children and Clean Air

The market for all-electric and hybrid vehicles has grown steadily in recent years due to technology advancements and greater private sector involvement. Furthermore, production costs continue to decrease and battery capabilities have improved.⁸ We anticipate that the demand for these vehicles will continue to grow as further advancements continue to drive down prices.

Recognizing the need for Washington to reduce NOx emissions, generate economic benefits, and deliver environmental justice benefits for our most vulnerable young populations while also providing municipal fleets with total cost of ownership benefits, the City of Renton recommends that you create competitive funding opportunities specifically for all-electric school buses.

We hope to participate in Washington's continued transition to a better air quality future with the purchase and deployment of all-electric school buses and offer our support as the planning process moves forward. Should you have any follow-up questions please contact me at 425-204-4458 or via email at michael.ingham@rentonschools.us.

Sincerely,

A handwritten signature in black ink, appearing to read "Michael Ingham", written over a white background.

Michael Ingham
Director of Transportation Operations,
Renton School District
425-204-4458
Renton, WA 98057

⁷ Sovacool, B. et al. "The Future Promise of Vehicle-to-Grid Integration: A Sociotechnical Review and Research Agenda". Annual Review of Environment and Resources, Volume 42, 2017. <http://www.annualreviews.org/doi/abs/10.1146/annurev-environ-030117-020220>.

⁸ Schlosser, N. "Can Electric School Buses Go the Distance?" School Bus Fleet, May 23, 2016. <http://www.schoolbusfleet.com/article/713421/can-electric-school-buses-go-the-distance>.